

Patent claims

1. A process for producing an Si_3N_4 -coated SiO_2 shaped body from an SiO_2 green body, wherein a precursor which is suitable for forming an Si_3N_4 sintered layer is applied to a surface of the amorphous, open-pore SiO_2 green body, and then the precursor is converted in situ into an Si_3N_4 sintered layer under a laser beam.
2. The process as claimed in claim 1, wherein the laser beam is the beam from a CO_2 laser.
3. The process as claimed in claim 1 or 2, wherein the SiO_2 shaped body is a solar crucible, and the precursor is applied on one side, to the inner-side surface of the SiO_2 green body.
4. The process as claimed in one of claims 1 to 3, wherein the precursor which is suitable for forming an Si_3N_4 sintered layer is selected from the group consisting of Si_3N_4 powder, silicon powder, silicon oxide/carbon mixtures and polysilazanes.
5. The process as claimed in claim 4, wherein the precursor is an Si_3N_4 powder.
6. The process as claimed in claim 5, wherein the Si_3N_4 powder has a grain size of between 100 nm and 100 μm , preferably between 100 nm and 50 μm and particularly preferably between 100 nm and 10 μm .
7. The process as claimed in claim 5 or 6, wherein the Si_3N_4 powder is applied in the form of an Si_3N_4 powder dispersion by spraying the surface of the SiO_2 green body, and is then

dried.

8. The process as claimed in claim 7, wherein the dispersion comprises a dispersant selected from the group consisting of alcohols, acetone and water.
9. The process as claimed in one or more of claims 6 to 8, wherein the Si_3N_4 powder layer which is present on the surface has a layer thickness of from 1 to 1000 μm , preferably from 1 to 500 μm .
10. The process as claimed in one or more of claims 1 to 9, wherein the SiO_2 green body, after the precursor has been applied, is irradiated by a laser beam with a focal spot diameter of at least 2 cm.
11. The process as claimed in one or more of claims 1 to 10, wherein the laser beam has a radiation power density of from 50 W to 500 W per square centimeter, particularly preferably from 100 to 200 and very particularly preferably from 130 to 180 W/cm^2 .
12. The process as claimed in one or more of claims 1 to 11, wherein the formation of the Si_3N_4 sintered layer takes place at a temperature of between 1000°C and 1600°C, particularly preferably between 1100°C and 1200°C.
13. The process as claimed in one or more of claims 1 to 12, wherein the irradiation is carried out uniformly and continuously.